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THE STUDY OF PRESENT POLYGONAL PONDS OF ARCTIC ECOSYSTEMS (YAKUTIA) IN PALAEOLIMNOLOGY

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Abstract. Polygonal ponds common in the North-East of Yakutia are poorly understood and represent interest in limnology and nature management. The comprehensive study of polygonal water was held in July 2017 at the monitoring plot area of Kytalyk Allaykhovskiy district of Yakutia (Indigirka river valley).

Study area, objects and methods.

The study area was located on the right bank of the Berelekh River (70°83’12.1”N., 147°48’29.9”E, altitude above sea level of 11 m) 28 km northwest of the settlement Chokurdakh (Fig.1). The study ponds were divided by location into two prevailing types of landscape – edoma and alas. In the fieldwork were measured morphometric and hydrochemical parameters of water and samples of a surface layer (0-1 cm.) The field material was collected using conventional methods with a standard set of accessories and equipment [1, 2]. Selected samples were preserved and stored at ~+4°C.

In General the studied reservoirs are shallow with a maximum depth of 0.6 m. and transparency to the bottom. The average water temperature during the study period did not exceed 10.4°C; pH varies from 3.6 to 7.8 with an average of 6.4 (neutral). Water is characterized by low mineralization and a high concentration of oxygen in the surface layer of water (to 11,18 mg/l). Data at the level of intraspecific taxa were used to determine the ecological characteristics of diatoms because the varieties of one species have different environmental indicators. Identified the relationship of diatoms to the conditions of the habitat, salinities, active reaction of the environment and geographical distribution [3, 4]. Ratio of algae to water salinity determined using the scale of globnet R. W. Kolbe [5]. The detected diatoms were separated into freshwaters and oligohalines (indifferents, halophobes, halophiles) and mesogalobic or saltwater groups. To determine the ratio of diatoms to the active reaction of water (pH) was used the scale Of F. Hustedt [4]. In the composition of the diatom flora was a dedicated group: Alkaliphile occurring at pH = 7, with optimum distribution at pH> 7, alkalibionts preferred water only with pH> 7; neutrophils develop at acidic and alkaline water; acidophiles with a predominant development at pH <7; aticidobiots - pH < 7, preferably 5.5 and below.

Results.

Diatoms in the preparations were determined before the species, variety and form. According to the results of the study of diatomic flora of the surface layer were identified 91 species of Bacillariophyceae’s class relating to 21 genera, 19 families and 11 orders. The highest quantity of species recorded in generas: *Eunotia* (26) и *Pinnularia* (13). Similar taxonomic structure of composition with the predominance of these genera typical for standing waters with occasionally changing hydrological regime. High species diversity (up to 33 species) noted in ponds of alas at a high level. The list of mass forms consists of 26 species. Of these dominates *Tabellaria flocculosa*

(Roth.) Kutz. on all ponds (up to 70%) belongs to the arctoalpine biogeographic group. The species is characterized by different habitats, by salinity and pH halophobe and acidophil. Then two species from the Eunotia genus (*E.bilunaris u E. subarcuatoides*).

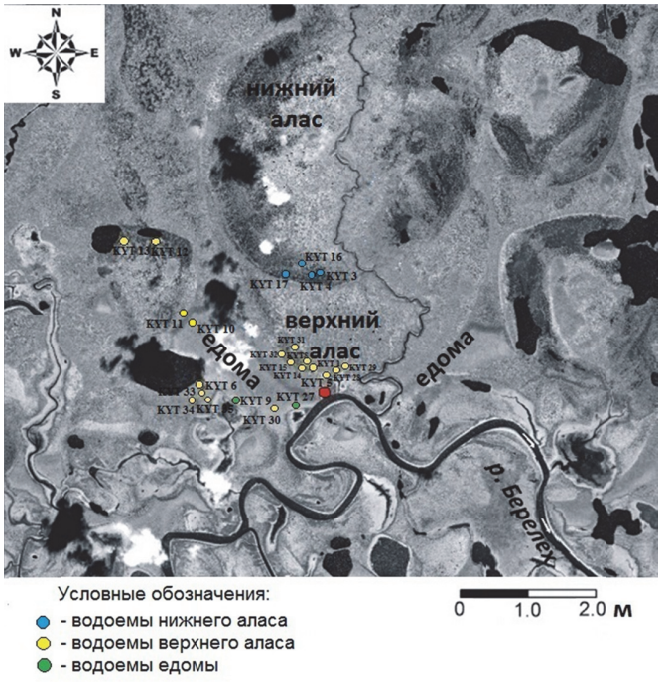

Fig. 1. The study region in the lower reaches of the Berelekh River

In General, in most of the studied reservoirs dominated epiphytic forms (from 37% to 100%), other part represented by bottom views (from 2% to 62%). Relative to water salinity indifferents dominated from 20% to 77%, to the pH acidophiles dominated (from 6% to 82%). Geographical analysis of the quantity of diatoms showed the dominance of the arctoalpine forms (from 4% to 75%) characteristic of northern arctic habitats.

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